ENVIRONMENTAL CHEMISTS

Lower

Limit:

60

60

60

Analysis For Total Metals By EPA Method 200.8

% Recovery:

80

Clie	ent ID:	M130180A Sm	Tank
Dat	e Received:	04/05/12	
Dat	e Extracted:	04/05/12	
Dat	e Analyzed:	04/06/12	
Mat	trix:	Aqueous	
Uni	its:	ug/L (ppb)	

Internal Standard:

Germanium

200.0	
Client:	Alaskan Copper Works
Project:	% of Acid PO M130180, F&BI 204069
Lab ID:	204069-01 x10,000
Data File:	204069-01 x10,000.083
Instrument:	ICPMS1
Operator:	AP

Upper

Limit:

125

125

125

C. C. 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3.5
Indium	82
Holmium	90
	Concentration
Analyte:	ug/L (ppb)
Chromium	1,160,000
Nickel	1,060,000
Copper	45,000
Zinc	<10,000
Arsenic	<10,000
Silver	<10,000
Cadmium	<10,000
Lead	<10,000
Iron Screen	5,020,000

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID: M130180A Lg Tank
Date Received: 04/05/12
Date Extracted: 04/05/12

Date Extracted: 04/05/12
Date Analyzed: 04/06/12
Matrix: Aqueous

Matrix: Aqueous Units: ug/L (ppb)

Client: Alaskan Copper Works

Project: % of Acid PO M130180, F&BI 204069

Lab ID: 204069-02 x10,000 Data File: 204069-02 x10,000.084

Instrument: ICPMS1 Operator: AP

		Lower	Upper
Internal Standard:	% Recovery:	Limit:	Limit:
Germanium	81	60	125
Indium	83	60	125
Holmium	91	60	125

Concentration Analyte: ug/L (ppb) 1,980,000 Chromium 1,660,000 Nickel Copper 117,000 Zinc <10,000 <10,000 Arsenic <10,000 Silver <10,000 Cadmium <10,000 Lead 9,080,000 Iron Screen

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client:	Alaskan Copper Works
Project:	% of Acid PO M130180, F&BI 204069

I Toject.	70 Of Acid I O
Lab ID:	I2-235 mb
Data File:	I2-235 mb.016
Instrument:	ICPMS1
Operator:	AP

		Lower	Upper
Internal Standard:	% Recovery:	Limit:	Limit:
Germanium	103	60	125
Indium	107	60	125
Holmium	104	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Nickel	<1
Copper	<1
Zinc	<1
Arsenic	<1
Silver	<1
Cadmium	<1
Lead	<1
Iron Screen	<250

ENVIRONMENTAL CHEMISTS

Date of Report: 04/12/12 Date Received: 04/05/12

Project: % of Acid PO M130180, F&BI 204069

Date Extracted: 04/09/12 Date Analyzed: 04/09/12

RESULTS FROM THE ANALYSIS OF AQUEOUS SAMPLES FOR SPECIFIC GRAVITY @ 15.56 °C

	Specific Gravity
M130180A Sm Tank 24069-01	1.11
M130180A Lg Tank	1.13

Note: The third significant digit is an estimate

ENVIRONMENTAL CHEMISTS

Date of Report: 04/12/12 Date Received: 04/05/12

Project: % of Acid PO M130180, F&BI 204069

Date Extracted: NA
Date Analyzed: 04/09/12

RESULTS FROM THE ANALYSIS OF AQUEOUS SAMPLES FOR PERCENT ACID

Sample ID Laboratory ID	Percent Acid
M130180A Sm Tank	8.0
M130180A Lg Tank 204069-02	9.3

ENVIRONMENTAL CHEMISTS

Date of Report: 04/12/12 Date Received: 04/05/12

Project: % of Acid PO M130180, F&BI 204069

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AQUEOUS SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 204014-01 (Matrix Spike)

				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Chromium	ug/L (ppb)	20	<1	103	95	71-130	8
Nickel	ug/L (ppb)	20	35.8	10 3 b	94 b	71-120	9 b
Copper	ug/L (ppb)	20	1.60	95	97	52-134	2
Zinc	ug/L (ppb)	50	<1	96	98	51-142	2
Arsenic	ug/L (ppb)	10	<1	97	98	51-167	1
Silver	ug/L (ppb)	5	<1	93	95	73-114	2
Cadmium	ug/L (ppb)	5	<1	98	100	86-115	2
Lead	ug/L (ppb)	10	<1	98	99	85-115	1

Laboratory Code: Laboratory Control Sample

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Chromium	ug/L (ppb)	20	97	80-119
Nickel	ug/L (ppb)	20	104	83-119
Copper	ug/L (ppb)	20	103	81-120
Zinc	ug/L (ppb)	50	102	82-120
Arsenic	ug/L (ppb)	10	99	81-118
Silver	ug/L (ppb)	5	100	85-116
Cadmium	ug/L (ppb)	5	100	86-118
Lead	ug/L (ppb)	10	95	84-120

ENVIRONMENTAL CHEMISTS

Date of Report: 04/12/12 Date Received: 04/05/12

Project: % of Acid PO M130180, F&BI 204069

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AQUEOUS SAMPLES FOR SPECIFIC GRAVITY

@ 15.56 °C

Laboratory Code: 204069-01 (Duplicate)

	Sample	Duplicate	Relative Percent	Acceptance
Analyte	Result	Result	Difference	Criteria
Specific Gravity	1.11	1.11	0	0-2

ENVIRONMENTAL CHEMISTS

Date of Report: 04/12/12 Date Received: 04/05/12

Project: % of Acid PO M130180, F&BI 204069

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF AQUEOUS SAMPLES FOR PERCENT ACID

Laboratory Code: 204069-01 (Duplicate)

			Relative			
	Sample	Duplicate	Percent	Acceptance Criteria		
Analyte	Result	Result	Difference			
Percent Acid	8.0	7.9	1	0-20		

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Data Qualifiers & Definitions

- a The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- A1 More than one compound of similar molecule structure was identified with equal probability.
- b The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.
- c The presence of the analyte indicated may be due to carryover from previous sample injections.
- d The sample was diluted. Detection limits may be raised due to dilution.
- ds The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.
- dv Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.
- fb Analyte present in the blank and the sample.
- fc The compound is a common laboratory and field contaminant.
- hr The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.
- ht Analysis performed outside the method or client-specified holding time requirement.
- ip Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j The result is below normal reporting limits. The value reported is an estimate.
- ${\bf J}$ The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.
- jr The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- js The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc The presence of the compound indicated is likely due to laboratory contamination.
- L The reported concentration was generated from a library search.
- nm The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc The sample was received in a container not approved by the method. The value reported should be considered an estimate.
- $\operatorname{pr}-\operatorname{The}$ sample was received with incorrect preservation. The value reported should be considered an estimate.
- ve Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- vo The value reported fell outside the control limits established for this analyte.
- x The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

04069 Sand Brown To (2011	20 Thr	400		SAMPLERS (S	ignature)			\Longrightarrow	7	100000000000000000000000000000000000000	PO VADI	UND TIME
Company ALARYA	PROJECT NAME/NO. PO#						O Standard (2 Woods) O'RUSH (CT)					
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City, State, ZIP_Sec Phone # 296-571-6	THE W	A 981	134	REMARKS		2000	VI	ali a		□ Disp	en after	•
		1						ANALY	ISBS REQU	ESTED		
Sample ID	Lab ID	Date	Time	Sample Type	# of on	TPH-Diesel	PTEX by SO21B	SVOC. by 8270	Bot Act	4g ASOL Or Cu FE	L Pb ZN	Notes

Sample ID	Lab ID	Date	Time	Sample Type	# of con	TPH-Die	TPH-One	DTEX by 8	SVOCe by	HFS	96 A	Spec, G.	4. 450	25.02.5	Ur Pb		Notes
M13080A Sm. tak	01	4/5/n	12:30	HNOZ	I						7	X	X	X	X		
Sm. tank							1	4	L								
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M130180B	02	4/4R	12:30	Hn03	1		+	+	+		\times	X	X	X	X		
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Samples received at _22_°C

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Charlene Morrow, M.S. Yelena Aravkina, M.S. Bradley T. Benson, B.S. Kurt Johnson, B.S.

3012 16th Avenue West Seattle, WA 98119-2029 TEL: (206) 285-8282 FAX: (206) 283-5044 e-mail: fbi@isomedia.com

April 12, 2012

Gerald Thompson, Project Manager Alaskan Copper Works 628 South Hanford Seattle, WA 98134

Dear Mr. Thompson:

Included are the results from the testing of material submitted on April 5, 2012 from the % of Acid PO M130180, F&BI 204069 project. There are 9 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures ACU0412R.DOC